









**Thermo-Gel®/POK NOZZLE
BACKBACK SYSTEM**

TRAINING MANUAL

Thermo-Gel®/POK Nozzle Backpack System Training Manual

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THERMO-GEL® FAMILIARIZATION

TOPIC:	Thermo-Gel® FAMILIARIZATION
TIME FRAME:	30 Minutes
LEVEL OF INSTRUCTION:	Level I
BEHAVIORAL OBJECTIVE:	
Condition:	Given a summary of information on the Thermo-Gel® product and its impact on fire suppression and fire protection
Behavior:	The student will identify accurate statements about the structure, characteristics, capabilities, use, application techniques, and safety protocols of Thermo-Gel®.
Standard:	To the satisfaction of the instructor
MATERIALS NEEDED:	Writing board/pad with markers/erasers Appropriate audiovisual equipment and screen Appropriate audiovisual materials Thermo-Gel® Training and Material Disk (Power Point and files)
REFERENCES:	Thermo-Gel® product references Thermo-Gel® Equipment Guide Product Use Instruction Sheet 5-Gallon Container Product Use Instruction Sheet Pro/Nozzle/Eductor Product Use Instruction Sheet PRO Nozzle Thermo-Gel® Q&A sheets Homeowner Cleaning Instructions Current Material Safety Data Sheet



PREPARATION:

Providing a sufficient thermal barrier between flammable materials and sources of ignition has been a monumental challenge for firefighters since fire protection and suppression activities were first initiated. “How do you get a sufficient amount of the ‘wet stuff’ on the ‘red stuff’ before it comes the ‘black stuff’!!!! Yet, the number of homes and property destroyed in the annual major conflagrations continues to rise. During the last 25-years; 1980 Panorama Fire San Bernardino

– 325 structures; 1990 Paint Fire Santa Barbara – 641 structures; 1991 Tunnel Fire Alameda – 2,900 structures; 1992 Fountain Fire Shasta – 636 structures; 1993 Laguna Fire Orange – 441 structures; 1999 Jones Fire Shasta – 954 structures; 2003 Old Fire San Bernardino – 1003 structures; 2003 Cedar Fire San Diego – 2820 structures; just to name a few.



PRESENTATION	APPLICATION
I. INTRODUCTION TO THERMO-GEL®	
A. Current Challenges	Slide 1
1. Homeowners are continually moving into more rural settings.	Slide 2
2. Current efforts to protect homes in the wildland urban interface.	
a) Homeowners frantically trying to “wet down” their roofs, wall, and shrubbery.	Slide 3
b) Firefighters arching streams of water on currently uninvolved exposures to protect them from flames and adjacent burning materials.	
B. New technology now available	
1. Years of research and testing went in to find a new, environmentally safe product.	
2. A new product is now available to assist both the homeowner and the fire service.	Slide 4
a) Developed by Thermo Technologies, LLC	
b) Fully patented and warranted	
c) US Forest Service Approved	Slide 5
d) An application system that puts a long lasting thermal barrier between structures and flames.	



PRESENTATION	APPLICATION
<p>C. Product description</p> <p>1. Composition</p> <p>a) Gel is mixed with water at a ratio of 1% for fire suppression and 2% for fire protection.</p> <p>b) When mixed with water it creates a gel consisting of millions of tiny <u>water-filled</u> bubbles.</p> <p>c) By holding water (unlike foams which are air filled)</p> <ul style="list-style-type: none">• The gel increases smothering action for suppression.• Adheres to the burning material• Enhances the cooling capability of the water• Extends to evaporation period <p>2. Effect on the fire triangle</p> <p>a) Attacks two side of the triangle: smothers and cools</p> <p>3. Impact on fire suppression</p> <p>a) Adheres to burning material</p> <p>b) Increases the effectiveness of water</p> <ul style="list-style-type: none">• 55% less water needed when compared to Class A foam	<p>Slide 6</p> <p>Slide 7</p> <p>Slide 8</p> <p>Slide 9</p>
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PRESENTATION	APPLICATION
<ul style="list-style-type: none">c) Reduces extinguishment time<ul style="list-style-type: none">• Fire suppressed 60% faster than with Class A foamd) Leaves a gel coating that prevents rekindle	Slide 10
4. Impact on fire protection	
<ul style="list-style-type: none">a) Gel clings to glass, metal, roof overhangs, wood or painted siding, vegetation, rubber, and other flammable solids.	Slide 11
<ul style="list-style-type: none">b) Provides a thermal barrier prohibiting combustible material from receiving radiant heat or direct flame impingement.	Slide 12
<ul style="list-style-type: none">c) Even under severe atmospheric conditions, the gel will provide protection for several hours.	Slide 13
5. Gel versus Foam	Slide 14&15
<ul style="list-style-type: none">a) Thermo-Gel® shows a marked increase in fire suppression and fire protection effectiveness when compared to standard foam products.	Slide 16&17
6. Environmental impact	
<ul style="list-style-type: none">a) The polymer, mineral oil, and surfactants in Thermo-Gel® decompose into carbon dioxide, nitrogen oxide, and water.b) Biodegradable	
	Page 5



PRESENTATION	APPLICATION
<p>c) Thermo-Gel® is very environmental compatible</p> <p>7. Clean-up</p> <p>a) Designed to be rinsed off with plain water</p> <p>b) Will naturally degrade from exposure to sunlight</p> <p>II. Fire Service and Homeowner Applications</p> <p>A. Fire Service</p> <p>1. Thermo-Gel® adheres to the burning material, increases the water effectiveness, reduces extinguishing time, cools the material, excludes oxygen, and prevents rekindle.</p> <p>a) Can be effectively used on industrial fires including:</p> <ul style="list-style-type: none">• Grain silos• Sawdust bins or piles• Log landings• Warehousing areas• Container storage bins• Palletized products <p>b) Is efficient for use on residential and commercial structure fires.</p> <p>c) Has the added advantage of extinguishment when use on wildland fires.</p> <ul style="list-style-type: none">• Ground and aerial application• Used in both fixed wing and helicopter aircraft	<p>Slide 18&19</p> <p>Slide 20</p> <p>Slide 21</p> <p>Slide 22</p> <p>Slide 23</p> <p>Slide 24</p>
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PRESENTATION	APPLICATION
<ul style="list-style-type: none">d) Effective on tire fires and other hard to extinguish materialse) Works well on prescribed fires, backfires, and firing out operations by pre-treating fire and control lines.	Slide 25
	Slide 26
B. Fire Protection	
	Slide 27
1. Thermo-Gel® clings to glass, metal, siding and vegetation, provides a thermal barrier, prevents radiant heat ignition, and blocks direct flame impingement.	
	Slide 28, 29&30
<ul style="list-style-type: none">a) Effectively provides a thermal barrier for:<ul style="list-style-type: none">• Structures and vehicles• Fuel and propane tanks• Ornamental vegetation, wood piles, and log decks.	
III. Application Systems	
	Slide 31
A. General Application Considerations	
1. In addition to 1 and 5 gallon systems, Thermo-Gel® in the following manner:	
<ul style="list-style-type: none">a) In separate holding and pumping systemsb) In pre-mixed batch tanksc) Through extended hose laysd) Through fire engine onboard eductor/proportionators	
	Page 7



PRESENTATION	APPLICATION
<div>CAUTION: Gel products and foam systems are NOT compatible. Gels not stored and mixed properly, and in the correct proportions, can thicken prematurely in plumbing and piping and may require extensive clean-up and equipment maintenance to remove.</div> <p>B. 5-Gallon nozzle eductor systems</p> <ol style="list-style-type: none"><li>1. Can be used by either the fire service or the homeowner.<li>2. Can be carried in a backpack or hand carried.<li>3. Water supply can come from a garden hose or from fire engine hose lines.<li>4. Allows for a one person operation.<li>5. Is easily donned, removed, and re-supplied. <p>C. 1-Gallon nozzle eductor systems</p> <ol style="list-style-type: none"><li>1. Can be used by either the fire service or the homeowner.<li>2. Carried easily by hand.<li>3. Water supply can come from a garden hose or from fire engine hose lines.<li>4. Allows for one person operation.	<p>Slide 32</p> <p>Slide 33</p>
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PRESENTATION	APPLICATION
<p>IV. Homeowner Advisements</p> <p>A. Thermo-Gel® is non-aggressive, safe on paint, wood, glass, stone, stucco, concrete, rubber, and vegetation.</p> <p>B. It is environmentally safe and bio-degradable and breaks down with exposure to sunlight.</p> <p>C. It can easily be washed off with a straight stream of water and is non-toxic to fish, pets, or wildlife.</p> <ol style="list-style-type: none">1. Rinse from the top down. Cleaners can be used.2. Not necessary to wash off vegetation.3. Caution must be taken when working around gel; IT IS EXTREMELY SLIPPERY and falls and serious injury could occur. <p>V. Further Information</p> <p>A. To reach company representatives or to receive more information:</p> <ul style="list-style-type: none">• Thermo Technologies, LLC, 923 E. Interstate Avenue, Bismarck, ND 58503.• Telephone number: 701-258-8208• 24 hour emergency/EERA/BPA telephone number: 866-255-8137.• Web page: www.thermo-gel.com.	<p>Slide 34&35</p> <p>Slide 36</p>
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TACTICAL USES OF Thermo-Gel®

TOPIC: TACTICAL USES OF THERMO-GEL®

TIME FRAME: 30 Minutes

LEVEL OF INSTRUCTION: Level I

BEHAVIORAL OBJECTIVE:

Condition: Given a summary of the tactical uses of Thermo-Gel®

Behavior: The student will be able to identify accurate statements about the tactical uses of Thermo-Gel®

Standard: To the satisfaction of the instructor

MATERIALS NEEDED:

- Appropriate audiovisual equipment and screen
- Thermo-Gel® Training and Materials Disk (Power Point and files)

REFERENCES:

- Thermo-Gel® product references
 - ✓ Thermo-Gel® Equipment Guide
 - ✓ Product Use Instruction Sheet 5-Gallon Container
 - ✓ Product Use Instruction Sheet PRO Nozzle/Eductor
 - ✓ Thermo-Gel® Q&A sheets
 - ✓ Homeowner Cleaning Instructions
- Current Material Safety Data Sheet

PREPARATION: Thermo-Gel® has proven itself as an effective fire suppression and fire protection product. Depending on the various viscosity application rates and the techniques used to apply the product, Thermo-Gel® has many tactical uses. It can be used from initial attack to mop-up, and for other such applications such as; structure protection, prescribed fire, aviation, and equipment/personnel protection.



PRESENTATION	APPLICATION
<p>I. Initial Attack Engine Applications</p> <p>1. A 1% viscosity is normally used</p> <ul style="list-style-type: none">• Much more uniform than foam, further reach.• Winds will not affect it as much as foam as it is thicker.• Excellent knock down and suppressant properties.• Thicker viscosity works better for heavier fuels and fuels with longer flame lengths.• Treat explosive fuels to reduce spotting.• Treat areas in front of the flaming front to stop the fire spread.• Pre-treat an area that is a very receptive bed for embers.• Burn off gel lines, especially in lighter fuels. <p>II. Mop-Up</p> <p>1. A 1-2% viscosity works best.</p> <ul style="list-style-type: none">• Straight stream with higher pressure can treat deep duff areas.• Use a 30 degree spray pattern for surface applications.• Treat standing vegetation, such as trees, by spraying the gel in an arc and allow it to drizzle down through the limbs.• Apply 1% coating when starting mop-up, perform a light mop-up/mixing, and then cap it with 2%.	



PRESENTATION	APPLICATION
<ul style="list-style-type: none">• If dealing with numerous spots such as along roadways, cap the spots with 2%, move on to the next spot, and then return to complete mop-up after all the spots have been contained. <p>III. Structure Protection</p> <p>1. A 2% viscosity is normally used.</p> <ul style="list-style-type: none">• Initially, Thermo-Gel® was used for structure protection with great success, especially during the 2003 San Diego area fires.• Once applied, will last approximately 2-4 hours depending on the environmental conditions of temperature, wind, and relative humidity.• Use gels as an insulating barrier against scorching, flame impingement, and fire.• Apply at about 3/16 inch thickness on vertical surfaces.• Thermo-Gel® will adhere to all types of surfaces.• Use enough pressure to get height and pattern needed. Consider 100 PSI.• Too much pressure will wash or blast gel off.• Coat under eaves and overhangs.• Spray gel onto trees near structures to reduce radiant heat, scorching, spotting, and fire.• At 2%, one gallon of concentrate will cover about 1000 square feet.• An engine company can treat 3 sides of a structure and the roof in about 20 minutes with 5 gallons of concentrate. If in doubt, treat all sides of the structure.	



TACTICAL USES OF Thermo-Gel®

PRESENTATION	APPLICATION
<ul style="list-style-type: none">• It will take 5-7 gallons of gel for a large sized home.• Start high and gel downward.• If applied too thick, or with too much pressure, it will slough off.• Using a 30 degree fog patten works best.• Spray around base of structures to prevent fire spread from vegetation.• Pre-treat dense vegetation or fuels with high spotting potential with a 1% viscosity to prevent flare-ups and spotting.• Once the water from Thermo-Gel® has evaporated, the remaining white powder residue can be re-hydrated at least once.• Use a fine spray: a straight stream will wash it off.• As re-hydration is occurring, the gel may shrink so a “touch up” coat may need to be applied.• Use gels to protect exposures such as propane tanks, RV’s, power poles, and fence posts.• Treat window and door screens with a low nozzle pressure. Apply the gel at a 90 degree angle across the screen and a small percentage of the gel will adhere to the screen.• Gel the areas under the porches as much as possible.• Place protective coverings over exposed areas, and then gel them.• The key is timing the application so that minimal apparatus are needed to cover the maximum structures thereby reducing firefighter exposure.• OES has end of line nozzle eductor systems and 10 gallons of Thermo-Gel® on all of their engines.• Thermo-Gel® should be considered for interior attack and mop-up to lesson water damage. (To date there is little experience using gel in interior for	



TACTICAL USES OF Thermo-Gel®

PRESENTATION	APPLICATION
<p>Interior attack.</p> <ul style="list-style-type: none">• Thermo-Gel® works well on tire fires. <p>IV. Prescribe Fire</p> <p>1. 1% viscosity works best.</p> <ul style="list-style-type: none">• Burn off of gel lines in lighter fuels to avoid line construction.• Gel cultural and archeological sites to avoid ground disturbance.• Protect facilities such as signs, bridges, structures, and improvements.• Apply quick thin coat to the vegetation next to the line to lower burn intensity and spotting potential.• Apply 1% coverage to vegetation outside the line to prevent scorching and potential of ignition.• Apply 2% coating to “cat faces” or other receptive areas for ignition from spots.• Use a 2% cap of gel on heavy fuels, logs, and stumps in mop-up. <p>V. Aviation</p> <p>1. Uses are normally in the .8 to 1.3 and 1.7% viscosity ranges.</p> <ul style="list-style-type: none">• Thermo-Gel® for helicopter operations at .8% to 1.3% weighs approximately 8.35 pounds, so the helicopter bucket loads weigh less and the operation of the helicopters is improved.• Advantages of Mobile Water Enhancer/Gel Bases utilizing Thermo-Gel® are:	



PRESENTATION	APPLICATION
<ul style="list-style-type: none">- Mobile, easy, quick to set up and move.- Mobile Base can be set up and produce 6000 gallons within an hour.- Proportioned gel can be moved in a water tender to a new plant location.- Easy to quickly move plant closer to where the gel is needed to save flight time and exposure.- Easy to change viscosities depending on needs.• Numerous reports of excellent direct aerial attack suppressants results.• One load of Thermo-Gel® has been found to be as effective as 5 loads of water• Effective at suppressing spots• Apply ahead of crews to reduce fire behavior and protect personnel.	
VI. Equipment/Personnel Protection	
<ul style="list-style-type: none">• Thermo-Gel® can be applied on, around, and under an engine to protect it in an entrapment situation.• It takes approximately 2 minutes to gel an engine and the area around it.• A safety zone can be created with gel.• The effective size of a deployment zone can be increased by using gel.• There is going to be an evaluation by San Dimas using gels to protect dozers and fire engines.	
VII. Clean-UP	
1. Structures	
<ul style="list-style-type: none">• Biodegrades naturally by UV sunlight.	



PRESENTATION	APPLICATION
<ul style="list-style-type: none">• can be rinsed off with a straight stream of water. If dry, it's best to re-hydrate with a fine mist, and then rinse it off.• Do not need to scrub or use other agents to remove it.• Will not stain or remove paint. <p>2. Equipment</p> <ul style="list-style-type: none">• Flush nozzles and hose by flowing water, and then rinse off.• Can also rinse nozzles in a weak solution of soapy water. (Dawn works well, as does salt water solution).• If vehicles are covered with wet gel, rinse off with water.• If vehicles are covered with dry gel, moisten with fine spray, let stand for 20 minutes, then rinse with low pressure (pressure washers do not help).• Some surfaces may appear shinny after rinsing. (This is from the mineral oil removing the oxidation).• If using equipment on a daily basis, clean at the end of the incident. <p>VIII. Safety and Support</p> <p>1. Safety</p> <ul style="list-style-type: none">• MSDA sheet is available• Treated surfaces will be slippery. Use caution during foot travel over gelled areas. <p>2. Support</p> <ul style="list-style-type: none">• Fire Specialist John Kruashaar at 530/355-8547 and johnkraushaar@hotmail.com.	



How To Operate the Thermo-Gel® POK 5-Gallon Backpack System

TOPIC:	HOW TO OPERATE THE THERMO-GEL® POK 5-GALLON BACKPACK SYSTEM
TIME FRAME:	30 Minutes
LEVEL OF INSTRUCTION:	Level II
BEHAVIORAL OBJECTIVE:	
Condition:	Given a fire suppression or structure protection assignment and a fire engine
Behavior:	The student will obtain the necessary equipment to assemble and set up the Thermo-Gel® POK 5-Gallon Backpack System and begin application of fire retardant gel to the fire or to the structure.
Standard:	By completing all steps necessary to initiate fire suppression or structure protection action within 90 seconds of receiving assignment.
MATERIALS NEEDED:	<ul style="list-style-type: none">• Fire Engine with normal compliment (hose, water, fittings, etc.)• Appropriate audiovisual equipment and screen• Thermo-Gel® Training and Materials Disk (Power Point and files)• Thermo-Gel® 5-Gallon Backpack and PRO Nozzle/Eductor System
REFERENCES:	<ul style="list-style-type: none">• Thermo-Gel® product references<ul style="list-style-type: none">✓ Thermo-Gel® Equipment Guide✓ Product Use Instruction Sheet 5-Gallon Container✓ Product Use Instruction Sheet PRO Nozzle/Eductor✓ Thermo-Gel® Q&A sheets✓ Homeowner Cleaning Instructions• Current Material Safety Data Sheet



How To Operate the Thermo-Gel® POK 5-Gallon Backpack System

PREPARATION:

The Thermo-Gel® POK 5-Gallon Backpack System provides fire service personnel and homeowners an added resource for use during fire suppression activities and structure fire protection assignments. The 5-gallon backpack system can be quickly put into service and provide thermal barrier protection to three sides of a structure and the roof in about 20 minutes with 5 gallons of gel concentrate.



How To Operate the Thermo-Gel® POK 5-Gallon Backpack System

PRESENTATION	APPLICATION
I. System Components	
	Slide 1
A. The Thermo-Gel® Class 'A' Fire Retardant Gel Concentrate system is made up of four basic components	
	Slide 2
1. The 5-gallon container	Slide 3
a) Gel is mixed with water at a ratio of 1% for fire suppression and 2% for fire protection.	
b) When mixed with water it creates a gel consisting of millions of tiny <u>water-filled</u> bubbles.	
c) By holding water (unlike foams which are air filled).	
<ul style="list-style-type: none">• The gel increases smothering action for suppression.• Adheres to the burning material• Enhances the cooling capability of the water• Extends to evaporation period	
	Slide 4
2. The 5-gallon container backpack	
a) Designed to securely and comfortably hold the 5-Gallon Container for fire fighter deployment of the gel.	
	Slide 5
3. The PRO nozzle and eductor	
a) Allows the Thermo-Gel® Class 'A' Fire Retardant Gel Concentrate to be mixed with water in the proper proportions for fire suppression and fire protection actions.	



How To Operate the Thermo-Gel® POK 5-Gallon Backpack System

PRESENTATION	APPLICATION
<p>4. The supply line and pick-up tube</p> <p>a) The Supply Line and Pick-up Tube are provided with the PRO Nozzle and Eductor system to allow the concentrate to flow from the 5-Gallon Container to the nozzle to be mixed with the flow of water.</p> <p>II. Donning and Use of the System</p> <p>A. Preparing For Use</p> <p>1. The gel container</p> <p>a) The 5-Gallon Container with the gel concentrate should be well shaken prior to removing the sealed cap.</p> <p>2. The pick-up tube</p> <p>a) The Pick-up Tube should be inspected to insure that it is clear of any obstructions and for clean and dry conditions.</p> <p>b) Extreme caution must be taken to avoid the introduction of any moisture into the concentrate, as it will cause the gel to thicken prematurely and will clog the system.</p> <p>c) Insert the Pick-up Tube into the container and tighten.</p> <p>d) These steps may be taken while the 5-gallon container is positioned within the backpack.</p> <p>3. Backpack Straps</p> <p>a) The straps should be extended to a comfortable position for donning and the clasps opened.</p>	<p>Slide 6</p> <p>Slide 7</p> <p>Slide 8</p>



PRESENTATION	APPLICATION
<ul style="list-style-type: none">b) Insert the 5-gallon Container into the backpack and snap the retaining strap closed.c) Position the Pick-up Tube to the side of the backpack to provide clearance for the Supply Line along the back and under the arm of the fire fighter. <p>4. The nozzle and eductor</p> <p>NOTE: The PRO Nozzle Eductor and Supply Line System have fixed screw mechanisms.</p> <ul style="list-style-type: none">a) This requires that the Supply Line be attached either while the eductor is separated from the nozzle or with the eductor attached to the nozzle and twisting the Supply Line onto the eductor.b) The only swivel connector located on the Supply Line is for attachment of the Supply Line to the Pick-Up Tube.c) Once all connections are made, the system is ready for donning.	<p>Slide 9</p> <p>Slide 10</p>
<p>B. Donning and Operation</p> <ul style="list-style-type: none">1. Don the assembled Backpack and tighten the shoulder, waist, and chest straps for a comfortable and secure fit.2. Thread the nozzle and Supply Line to the appropriate side of the firefighter.<ul style="list-style-type: none">a) There are rings on the shoulder straps to locate clips or carabineers to attach the nozzle by the “D” handle to the Backpack for hands free storage.	



PRESENTATION	APPLICATION
<p>3. Select the desired flow rate: OFF, 1%, or 2%.</p> <p>4. Attach the appropriate water line and charge the system.</p> <p>a) Using the OFF position will allow the water line to be charged, desired water pressure obtained, and optimum stream or fog pattern established.</p> <p>5. Set the eductor to the required flow percentage and Gel concentrate will begin to through the Pick-up Tube and Supply Line.</p> <p>a) The FLUSH position fully opens the Supply Line orifice; concentrate flows at an increased rate, reduces coverage levels available, and places extremely thickened gel into the nozzle system.</p> <p>b) Immediately after using the FLUSH position, large amounts of water must be allowed to flow through the nozzle system to remove any highly thickened gel and un-diluted concentrate.</p> <div>CAUTION: The FLUSH position may assist with the establishment of concentrate flow but should ONLY be used for short durations and/or to clear possible obstructions in the lines or nozzle.</div>	<p>Slide 11</p>
<p>C. Clean-Up After Use</p> <p>1. thoroughly clean and remove ALL concentrate and gel from the nozzle, supply line, and pick-up tube.</p> <p>2. Water with mild detergent and/or mineral oil works well to clean and flush all equipment parts.</p> <p>3. All parts must be clean and dry.</p>	<p>Slide 12</p>



PRESENTATION	APPLICATION
<p>4. An air hose may be used to blow out and thoroughly dry all parts.</p>	
<p>III. Storage And Maintenance</p>	
<p>A. Inspections And Care</p>	Slide 13
<p>1. Check location and condition at beginning of each Shift.</p>	
<p>2. Inventory system and shake container once a week.</p>	
<p>3. Include system in monthly training exercises. Make sure the eductor is in the off position.</p>	
<p>4. Clean and dry nozzle/eductor and supply line/pick-up tube monthly.</p>	
<p>5. Full nozzle breakdown should only be done by a certified technician.</p>	
<p>B. Storage</p>	Slide 14
<p>1. Thermo-Gel® Containers should be stored with their lids sealed and within a dry area.</p>	
<p>a) Containers should be shaken immediately prior to use and occasionally while being stored.</p>	
<p>b) Current shelf life is 3-5 years.</p>	
<p>2. The 5-gallon container can be stored in the backpack.</p>	



PRESENTATION	APPLICATION
<p>3. The PRO nozzle/eductor and supply line/pick-up tube must be stored in a clean and dry location.</p> <p>a) Best if stored in a bag along with the container and backpack.</p> <p>C. Trouble Shooting</p> <p>1. Failure to educt</p> <p>a) Check water flow (20 gpm)</p> <p>b) Check water pressure (75-100 psi at nozzle)</p> <p>c) Check eductor selection position (Off, 1%, 2%)</p> <p>d) Check supply line/pick-up tube connections for tightness and seal.</p> <p>e) Use the FLUSH position for 1-3 seconds to purge the system.</p> <p>f) Breakdown system and check for clogging, debris, or dried concentrate or gel in the lines or orifices.</p> <p>2. DO's and DON'T's</p> <p>a) DO Keep the nozzle/eductor and supply line/pick-up tube clean and dry.</p> <p>b) DO completely clean system after each use.</p> <p>c) DO NOT allow water to enter concentrate container.</p> <p>d) DO NOT premix concentrate in NON Thermo-Gel systems.</p> <p>e) DO NOT put Thermo-Gel® into existing engine foam tank systems.</p> <p>f) DO NOT mix Thermo-Gel® and foam applicator hardware (foam and gel are not compatible).</p> <p>g) REMEMBER-Thermo-Gel® is extremely slippery and injury could occur from slips and falls.</p>	<p>Slide 15 & 16</p>

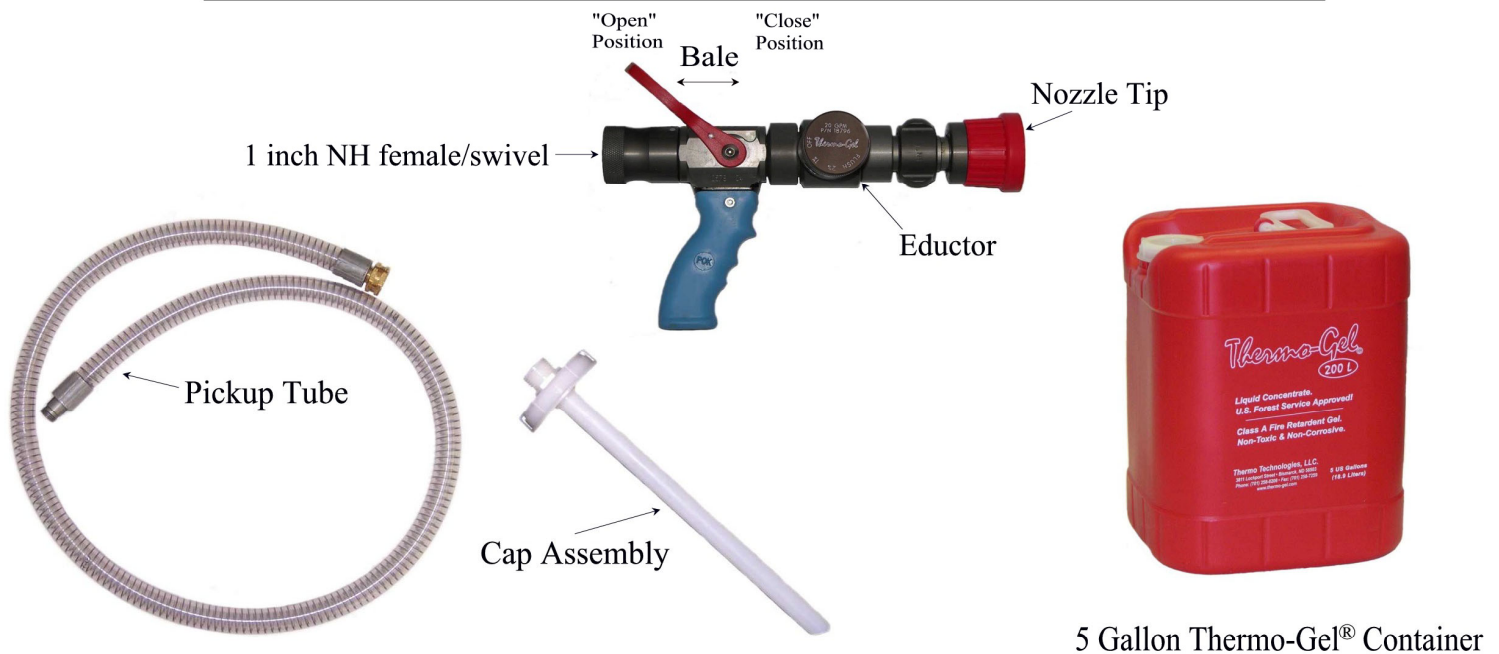


How To Operate the Thermo-Gel® POK 5-Gallon Backpack System

PRESENTATION	APPLICATION
<p>IV. Further Information</p> <p>A. To reach company representatives or to receive more information:</p> <ul style="list-style-type: none"><li>• Thermo Technologies 923 E. Interstate Avenue, Bismarck, ND 58503<li>• Telephone number: 701-258-8208<li>• 24 hour emergency/EERA/BPA telephone number: 866-255-8137<li>• Web page: <a href="http://www.thermo-gel.com">www.thermo-gel.com.	<p>S</p>



Product Use Instruction Sheet for Gel Pro 5 Gallon Kit



Shake Well Before Use!

1) Securely tighten pickup tube to the eductor. Make sure that there is a rubber gasket in the eductor.



2) Remove the cap from the 5 gallon container. Install the Cap Assembly and attach the Pickup Tube.



3) Attach hose to end of Nozzle. Make sure the Bale is in the "Close" position.

4) Start water flow. Pull the Bale handle towards you into the "Open" position. The gelled water will begin to flow after choosing a setting on the eductor in approximately 4-5 seconds. You are now ready to use Thermo-Gel®.



* Note: Flow water at 80 - 175 psi
Do not flow under or over this range.

See Next Page For Application Instructions



Application Instructions

- 1) Set Eductor to desired setting, "1%" for direct fire suppression, perimeter protection and for protecting vegetation, or "2%" for structure and home protection. If gel is not flowing switch the Eductor to the "Flush" setting, as soon as it produces a thick gelled water, switch back to your desired setting.
- 2) Apply Thermo-Gel® to the entire structure using a fog pattern at a "2%" setting. Start from top to bottom coating the furthest and overhead surfaces first.*
- 3) Apply Thermo-Gel® to surrounding vegetation and trees using a "1%" setting. Remember to apply Thermo-Gel® away from yourself.
- 4) When changing gel containers first close the Bale. Remove cap from the new container. Remove the Cap Assembly and Pickup Tube from the used container. Install Cap Assembly and Pickup Tube on the new container. Pull Bale handle towards you. The gelled water will begin to flow in approximately 4-5 seconds.
- 5) After the fire danger has passed, rinse all treated areas thoroughly with plain water.

*** When using a ladder to apply Thermo-Gel®, use caution as the product creates very slippery conditions.**

Cleaning Tips:

After the fire danger has passed, disassemble the entire kit as illustrated on the reverse side of page. Flush all components thoroughly with water. After flushing dry all components completely. If components still feel slippery, flush with additional water.**

****Note:** Do not introduce any water into the 5 gallon container as this will contaminate the gel concentrate. Any contaminated product should not be used.

Safety:

Thermo-Gel® is slippery when applied to surfaces. Use caution when walking or standing in treated areas. Always remember to apply the product in directions away from yourself to avoid this.

This product is covered by U.S. patent numbers 5,989,446 & 6,245,252. Other patents pending.

THERMO TECHNOLOGIES, LLC.

400 East Broadway Suite 50 • Bismarck ND 58501
Phone: (701) 258-8208 • Toll Free (800) 538-8122
Fax: (701) 258-7259 • www.thermo-gel.com

Thermo Technologies, LLC.

POK Warranty Statement:

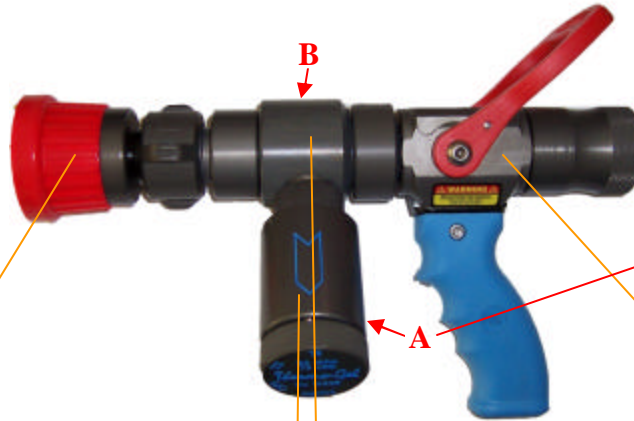
We warrant POK of North America Inc. ("POK") products for a period of ten (10) years after purchase against defects in materials or workmanship. POK will repair or replace a product that fails to satisfy this warranty. Repair or replacement shall be at the discretion of POK. Products must be promptly returned to POK for warranty service. We will not be responsible for: wear and tear, any improper installation, use, maintenance or storage, negligence of the owner or user, repair or modification after delivery, failure to follow our instructions or recommendations, or other misused activity beyond our control. Warrantor reserves the right to change the parts or design of its products from time to time without notice, and with no obligation to maintain spare parts or to make corresponding changes in the products previously manufactured. WE MAKE NO WARRANTIES, EXPRESS OR IMPLIED, OTHER THAN THOSE INCLUDED IN THIS WARRANTY STATEMENT, AND WE DISCLAIM ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Further, we will not be responsible for any consequential, incidental or indirect damage (including, but not limited to, any loss of profits) from any cause whatsoever. No person has authority to change this warranty.

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Thermo-Gel PRO NOZZLE Disassembly Instructions

Thermo-Gel's PRO Nozzle consists of four primary components:



Nozzle Assembly

No further breakdown should be required for thorough cleaning.



Regulator / Check Valve

See inset "A" for further breakdown.



Venturi Valve Assy.

See inset "B" for further breakdown.



Bale & Handle Assy.

No further breakdown should be required for thorough cleaning.

Inset "A":



Inset "B":



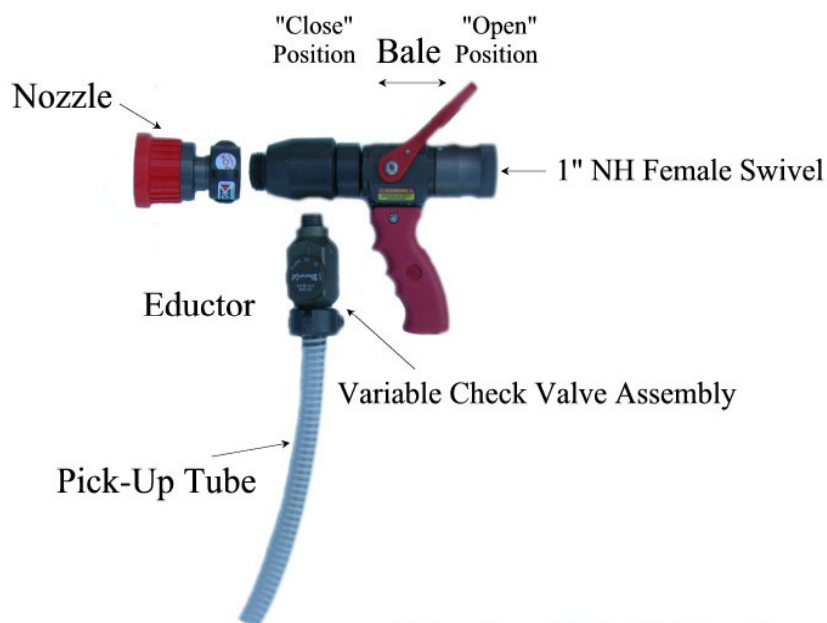
1. Remove Nozzle Assy., clean and set aside.
2. Remove Regulator, set aside.
3. Remove set screw "A", remove 22 small bearings.
4. Remove Bale & Handle Assy., clean and set aside.
5. Clean Venturi Valve Assy. - Unscrew the plastic cone from the end of the Venturi Valve Assy. (finger tight only) (see inset "B"), clean thoroughly and set aside.
6. Breakdown the Regulator / Check valve Assy. by removing set screw "B", remove 20 small bearings.
7. Pull apart the Regulator, remove 2 large bearings and springs (see inset "A"), clean thoroughly.
8. Lubricate all internal O-Rings.
9. Reassemble.

Thermo-Gel
200 L

Thermo-Gel®

Product Use Instruction Sheet for Gel Pro 1 Gallon Kit

POK ONE GALLON PARTS:



1 Gallon Thermo-Gel® Container

Shake Well Before Use!

- 1) Remove cap from Thermo-Gel® container. Install Pick-Up Tube and Nozzle/Eductor as shown. Tighten securely into place.



- 2) Attach hose to end of Bale. Make sure the Bale is in the "Close" position.



- 3) Start water flow*. Pull the Bale handle towards you into the "Open" position. The gelled water will begin to flow in approximately 4-5 seconds. You are now ready to use Thermo-Gel.®

* Note: Flow water at 80-175 psi. Do not flow under or over this range.

See Next Page For Application Instructions



Application Instructions

- 1) Set Eductor to desired setting, "1%" for direct fire suppression, perimeter protection and for protecting vegetation, or "2%" for structure and home protection. If gel is not flowing, switch the eductor to the "Flush" setting, as soon as it produces a thick gelled water, switch back to your desired setting.
- 2) Apply Thermo-Gel® to the entire structure using a fog pattern at a "2%" setting. Start from top to bottom coating the furthest and overhead surfaces first.*
- 3) Apply Thermo-Gel® to surrounding vegetation and trees using a "1%" setting. Remember to apply Thermo-Gel® away from yourself.
- 4) When changing gel containers first close the Bale. Remove cap from the new container. Remove the Pick Up-Tube and Nozzle/Eductor from the used container. Install Pick-Up Tube and Nozzle/Eductor on the new container. Pull Bale handle towards you. The gelled water will begin to flow in approximately 4-5 seconds.
- 5) After the fire danger has passed, rinse all treated areas thoroughly with plain water.

*** When using a ladder to apply Thermo-Gel®, use caution as the product creates very slippery conditions.**

Cleaning Tips:

After the fire danger has passed, disassemble the entire kit as illustrated on the reverse side of page. Flush all components thoroughly with water. After flushing dry all components completely. If components still feel slippery, flush with additional water.**

****Note:** Do not introduce any water into the 1 gallon container as this will contaminate the gel concentrate. Any contaminated product should not be used.

Safety:

Thermo-Gel® is slippery when applied to surfaces. Use caution when walking or standing in treated areas. Always remember to apply the product in directions away from yourself to avoid this.

This product is covered by U.S. patent numbers 5,989,446 & 6,245,252. Other patents pending.

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Thermo Technologies, LLC.

POK Warranty Statement:

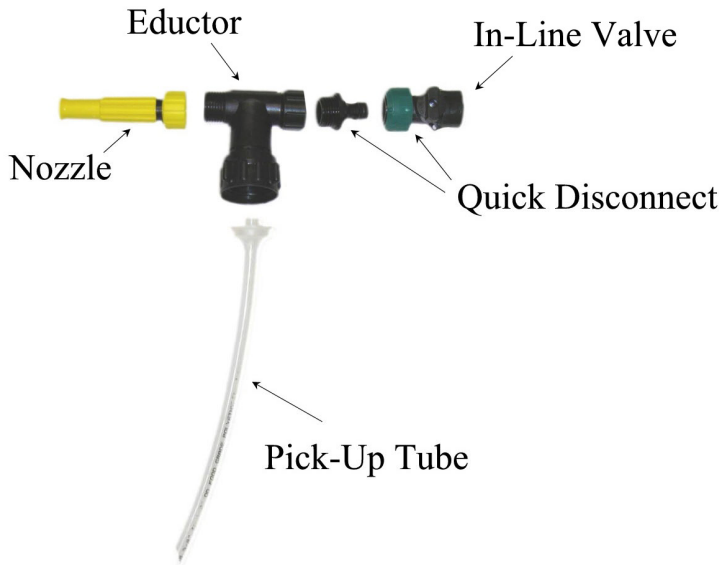
We warrant POK of North America Inc. ("POK") products for a period of ten (10) years after purchase against defects in materials or workmanship. POK will repair or replace a product that fails to satisfy this warranty. Repair or replacement shall be at the discretion of POK. Products must be promptly returned to POK for warranty service. We will not be responsible for: wear and tear, any improper installation, use, maintenance or storage, negligence of the owner or user, repair or modification after delivery, failure to follow our instructions or recommendations, or other misused activity beyond our control. Warrantor reserves the right to change the parts or design of its products from time to time without notice, and with no obligation to maintain spare parts or to make corresponding changes in the products previously manufactured. WE MAKE NO WARRANTIES, EXPRESS OR IMPLIED, OTHER THAN THOSE INCLUDED IN THIS WARRANTY STATEMENT, AND WE DISCLAIM ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Further, we will not be responsible for any consequential, incidental or indirect damage (including, but not limited to, any loss of profits) from any cause whatsoever. No person has authority to change this warranty.

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Thermo-Gel®

Homeowner Kit Instruction Sheet



1 Gallon Thermo-Gel® Container
(4 per kit)

Shake Well Before Use!



- 1) Attach hose to end of Quick Disconnect. In-Line Valve should be in the "off" position as indicated on the valve.



- 2) Shake Thermo-Gel® container before use. Before shaking, be sure that the cap is secure.



- 3) Remove cap from Thermo-Gel® container. Install Pick-Up Tube and Nozzle/Eductor as shown. Tighten securely into place.

- 4) Attach the Quick Disconnect to the Eductor, again be sure that the In-Line Valve is in the "off" position as indicated on the valve. Start water flow and turn the In-Line Valve to the "on" position. The gelled water will begin to flow in 4-5 seconds. Adjust the Nozzle for desired reach and pattern.



See Next Page For Application Instructions



Application Instructions

- 1) Apply gel to the entire structure using a fog pattern. Start from top to bottom, coating the furthest and overhead surfaces first.*
- 2) Apply gel to surrounding vegetation and trees last. Remember to apply the gel away from yourself.
- 3) When changing Thermo-Gel® containers, first close the In-Line Valve. Shake new container and then remove the cap. Remove the Pick-Up Tube and Nozzle/Eductor from the used container. Install Pick-Up Tube and Nozzle/Eductor on the new container. Open the In-Line Valve. The gelled water will begin to flow in approximately 4-5 seconds.
- 4) After the fire danger has passed, rinse all treated areas thoroughly with plain water.

*** When using a ladder to apply Thermo-Gel®, use caution as the product creates very slippery conditions.**

If on the rare occasion your homeowner's kit would fail to operate, the following is a troubleshooting list:

- 1) If possible, check your psi. The kit needs a minimum water pressure of 30 psi (pounds per square inch) to operate correctly.
- 2) Unscrew the nozzle and rinse it with your garden hose. Reconnect and test your unit.
- 3) Remove the Eductor and Pick-Up Tube from the Thermo-Gel® container. Screw the lid back onto the gel container to assure no water gets into the container. Remove the Eductor from the Pick-Up Tube and rinse with water. Dry Eductor thoroughly and re-attach the Pick-Up Tube. Test your unit again.

After the fire danger has passed, disassemble the entire kit as illustrated on the reverse side of page. Flush all components thoroughly with water. After flushing dry all components completely. If components still feel slippery, flush with additional water.**

****Note:** Do not introduce any water into the 1 gallon container as this will contaminate the gel concentrate. Any contaminated product should not be used.

Safety:

Thermo-Gel® is slippery when applied to surfaces. Use caution when walking or standing in treated areas. Always remember to apply the product in directions away from yourself to avoid this.

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Homeowner Cleaning Instructions



Your home has been treated and saved with a gel retardant trade-named Thermo-Gel®. This technology encapsulates water, which then forms a water gel coating that effectively retards fire and evaporation. Thermo-Gel® has been approved for use by the U.S. Forest Service and is non-toxic and U.V. degradable (sunlight degradable).

Cleaning Instructions:

- 1) Rinse your home thoroughly with water starting from the roof and working your way down the home.
- 2) Windows can be cleaned with a window cleaner.
- 3) If surrounding vegetation has been treated, you do not have to rinse the product as it will not harm vegetation.
- 4) Thoroughly rinse all sidewalks, driveways or walkways as Thermo-Gel® is very slippery.
- 5) Please note that it is normal to see a milky-white color when removing Thermo-Gel®. The run-off is not harmful to the environment.

* If the Thermo-Gel® is dry you will have to reactivate it by spraying it with a water mist, let it soak in and then rinse with a straight stream.



**Use extreme caution when walking or standing in treated areas.
Never stand on a roof or ladder when rinsing your home as
Thermo-Gel® can be very slippery!**

If you have any questions, contact us at:

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Thermo Technologies, LLC.

SCOTTY FIREFIGHTER PRODUCTS

STATEMENT OF LIMITED WARRANTY AND REPAIR

Thermo Technologies, LLC warrants the original purchaser of its line of Scotty Firefighter products, ("equipment"), that Scotty Firefighter has warranted that the equipment shall be free from defects in material and workmanship during the five (5) year period from the date of purchase.

Thermo Technologies obligation under this warranty is specifically limited to replacing or repairing the equipment, which are shown by Thermo Technologies examination to be in a defective condition attributable to Scotty Firefighter. To qualify for this limited warranty, the claimant, within a reasonable time after discovery of the defect, must return the equipment to Thermo Technologies, at 3811 Lockport Street, Bismarck ND 58503, or to the original distributor who will return the equipment to Thermo Technologies. Thermo Technologies will inspect the equipment and if Thermo Technologies determines that there is a defect attributable to Scotty Firefighter, it will, within a reasonable time repair or replace the equipment under warranty.

Thermo Technologies shall have no obligation under this limited warranty if the equipment is, or has been misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or it has been repaired or altered by someone else.

There are no warranties that extend beyond the face hereof. All other warranties, express or implied, including merchantability, shall be excluded.

Thermo Technologies shall not be liable for indirect, special, incidental or consequential damages arising from the use of this product.

Thermo Technologies, LLC.

THERMO-GEL[®] BACKPACK

STATEMENT OF LIMITED WARRANTY AND REPAIR

Thermo Technologies, LLC expressly warrants to the original purchaser that Tru North Gear has warranted that the Thermo-Gel[®] Backpack shall be free from defects in material and workmanship for a period of two (2) years. This warranty shall apply to the use of this product under normal conditions and for the purpose for which it was designed, and shall not apply to normal wear and tear or damage related to alterations, accidents, misuse, improper care or negligence.

There are no warranties that extend beyond the face hereof. All other warranties, express or implied, including merchantability, shall be excluded.

Thermo Technologies shall not be liable for indirect, special, incidental or consequential damages arising from the use of this product.

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Thermo-Gel[®] shaking instructions

5 gallon shaking instructions

To properly shake your Thermo-Gel[®] we recommend that you go to your local hardware store or Home Depot, wherever paint supplies are sold. You need to purchase a paint mixer electric drill attachment (pictured below). You will then proceed to use the mixer to agitate the gel for 3 minutes making sure to get into the corners and bring the product from the bottom to the top to ensure a good mix.

Product Description: Paint mixer electric drill bit attachment

- Power driven
- Use with electric drill
- Mixes material "through the bung"
- Steel
- For paint, sealers, coatings
- Corrosion resistant



1 gallon shaking instructions

The 1 gallon Thermo-Gel[®] containers can be shaken by hand. Shake vigorously for 3-5 minutes.

QUESTIONS ABOUT THERMO-GEL®

Q: What is Thermo-Gel®?

A: Thermo-Gel® is a gel concentrate, that when added to water, transforms water into a fire preventing and heat absorbing gel. This gel adheres to any kind of surface, even to vertical window panes and forms a protective layer of gel that cools and protects objects from heating, charring and flame impingement. This gel can also be used for bringing fires under control more quickly. Water and timesavings of up to 50% are possible.

Questions related to Structure/Home Protection

Q: What can be protected with Thermo-Gel®?

A: Thermo-Gel® will protect any surface, such as shrubs, trees, windows, siding, cars, fuel tanks, rail cars, utility poles, etc.

Q: Does Thermo-Gel® cause damage to my house?

A: Thermo-Gel® is an environmentally compatible, non aggressive gel, consisting of 98% water, a small portion of surfactants and the gelating agent, which is a super absorbent polymer, similar to those used in baby diapers. Thermo-Gel® is not aggressive to paint, wood, glass, stone or concrete. Due to high water content, direct exposure to electricity should be avoided in order to reduce the risk of short circuits.

Q: How much do I need for my house?

A: 1 gallon of Thermo-Gel®, per 50 gallons of water (2% dilution), will cover 1,000 square feet.

Q: How long does the protection last?

A: When applied at the proper amount, Thermo-Gel® will protect a structure for several hours. The cooling effect is provided by the evaporation of water from the gel. As long as there is still a gel layer on the object, it will remain protected. Strong winds and very high temperatures will decrease the protection time.

Q: At which temperature does Thermo-Gel® start to burn?

A: The gel consists of 98% water. Just like water, the gel never starts to burn. Only after all of the water has been evaporated the residuals can begin to be burnt. However, as they make up for less than 2%, there is barely enough energy set free in this unlikely case. The polymer decomposes mainly into carbon dioxide, nitrogen oxide and water. No toxic components like cyanides or hydrogen chloride have been found.

Q: How else can I use Thermo-Gel®?

A: Thermo-Gel® is very effective in creating a home defense barrier around a structure so it can be used to create a fire free zone around a house.

Questions related to Forest Fire Fighting

Q: How do I create a fire lane/firebreak with Thermo-Gel®?

A: Spray the gel on the vegetation. Make sure that the foliage, grass, branches; combustibles on the ground are well covered.

Q: How much do I need to create a fire lane?

A: One 5 gallon container of Thermo-Gel® at 2% dilution, will cover a surface of approximately 5,000 square feet. At 1% dilution, the same amount will cover 10,000 square feet.

Questions related to Fire Fighting

Q: Can Thermo-Gel® be used to extinguish fires?

A: Thermo-Gel® is very effective in fighting Class A fires. It can knock down fires in minimum time with a minimum amount of water needed. It also minimizes the risk of rekindling, even when very critical combustibles are burning.

Q: Can Thermo-Gel® be used to extinguish liquid combustibles like petroleum or diesel?

A: No, Thermo-Gel® is a Class A fire additive. It works perfectly on solids, but Class B pool fires cannot be fought with Thermo-Gel®. It is possible, however, to protect mineral oil tanks and similar items from fire by applying a gel coating on the surface and prevent ignition extremely effectively.

Q: Is it easy to cleanup?

A: Yes, Thermo-Gel® can be washed off with a strong stream of water pressure. In case of stubborn residues or large amounts of gel, treatment with regular household salt will help.

Questions related to Application and Equipment

Q: How is Thermo-Gel® applied and where do I get the equipment?

A: It can be applied with a nozzle end eductor as provided by Thermo Technologies, L.L.C. For more information please call (701) 258-8208.

Q: Can I dilute Thermo-Gel® inside the container with water?

A: No, this is not possible. It must be strictly taken care that no water gets into the container reservoir, as Thermo-Gel® will immediately form gel inside the container, and may block the system.

Questions related to Application and Equipment (Cont.)

Q: Can Thermo-Gel[®] be added to a secondary foam tank on fire engines?

A: Yes, it must be clean and free of water. Care must be taken that also the plumbing and the metering device are water free before it is injected.

Q: Can Thermo-Gel[®] be mixed with fire fighting foams?

A: Thermo-Gel[®] cannot be mixed with Class A foam concentrates due to the high water content of the foam concentrate. This would lead to uncontrolled gelation in the reservoir before the product can be used.

Q: Can the product be used with very hard water?

A: Yes, but the proportions may have to be increased due to the loss of effectiveness with very hard water.

Q: Does it require any special handling?

A: Thermo-Gel[®] is very slippery when applied, please use caution.

Q: How far can I project the gel? Does it behave similar to foam?

A: When the same nozzle pressure is applied, the projection distance is at least equal to water. Foam cannot be projected as far as Thermo-Gel[®] and Thermo-Gel[®] lasts much longer.

Questions related to Storage

Q: How long can I store Thermo-Gel[®]?

A: 3 years from the date of purchase, after that the product has expired.

Q: Can I store Thermo-Gel[®] in any container?

A: Some metals can be affected, high-grade steel and aluminum work just fine. Plastic materials should be plasticizer free (no Styrofoam), HD-PE and polyester resins are fine. We recommend storing product in its original container.

Q: Are there any specific requirements for storage?

A: Thermo-Gel[®] should be stored above freezing and below 104 degrees Fahrenheit. It should preferably be stored in a place without direct UV exposure. Containers must always be tightly closed.

Q: What is the shelf life of a 1% solution?

A: Tests with fire extinguishers show at least a 2-year shelf life. UV exposure shortens shelf life.

Questions related to the Environment

Q: What happens to a plant that is protected by Thermo-Gel®?

A: We have not observed any long-term damage to plants in recent years. The gel at the foliage can cause spots on the leaves due to the tendency of the gel to absorb moisture. At a very heavy coverage over some days and under drought conditions, this depending on the type of plant, can cause a drying effect on the leaves. Some plant species may lose their leaves. However, this effect is only temporary and very soon these plants develop new leaves again.

Q: What happens when the gel will get in the soil?

A: The gel will only enter the top layer of the soil. There is no possibility for leaching.

Q: Will Thermo-Gel® persist in the environment?

A: Thermo-Gel® is a water/oil emulsion containing a polymer. The main constitution of the oil phase is a fatty acid ester of biological origin. The oil phase is readily biodegradable, while the remaining polymer is expected to biodegrade with time. This is reflected in biodegrading studies that were carried out with similar polymers. Recent studies demonstrated that polymers of this kind are biodegraded by white rot fungus in soil. The process is at a low but constant rate. The polymers are solubilized, incorporated into the fungus mycelia and mineralized. The constituents of the polymer will enter into the natural carbon and nitrogen cycle. No toxic metabolites have been identified.

Q: What are the effects of Thermo-Gel® until it is biodegraded?

A: The polymer in Thermo-Gel® which provides the gelation effect and which shows the slowest biodegrading among the components of Thermo-Gel®, is very similar to other products which are used for soil enhancement or erosion control. These products improve and help to recover soil by balancing the moisture content or preventing erosion after catastrophes like flooding, severe drought or fires. They are intentionally brought into the environment and are harmless. There is no proof that the polymers in Thermo-Gel® are effective in this way, too, yet negative effects of the polymers are obviously not expected.

Product is covered by U.S. patent numbers 5,989,446 & 6,245,252. Other patents pending.

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THERMO TECHNOLOGIES



Professional Firefighter Equipment Guide



The Solution for Fire Professionals. TM



5 Gallon Container System

Thermo-Gel® is applied at two percentages, 1% for suppression and wet lines or 2% for home and structure protection. Thermo-Gel® is designed to be used only with Thermo-Gel® equipment.



Thermo-Gel® 5 Gallon Container

- Part#: TG200L5
- Class A Fire Retardant Gel
- U.S. Forest Service Approved
- Each gallon covers approximately 1,000 square feet at 2% and 2,000 square feet at 1%.



Thermo-Gel® 5 Gallon Pro Nozzle/Eductor

- Part#: TG20PK5 (20 GPM)
- Rugged metal design
- 1" NST
- Variable eductor at 1% or 2%
- Straight stream or fog pattern tip
- Pistol grip for easy handling
- Includes pick up tube & cap assembly for quick connection to 5 gallon container



Thermo-Gel® 5 Gallon Container Backpack

- Part#: TG200LBP
- Designed for comfort and durability
- Reflective tape for safety
- Carries (1) 5 gallon container



Thermo-Gel® 5 Gallon Eductor

(For use with the 5 gallon Pro Nozzle)

- Part#: TG20E5 (20 GPM)
- Rugged metal design
- Designed to be used with the Pro Nozzle
- Variable eductor at 1% or 2%
- Flush mode for easy cleaning
- Includes pick up tube & cap assembly for quick connection to 5 gallon container



1 Gallon Container System

Thermo-Gel[®] is applied at two percentages, 1% for suppression and wet lines or 2% for home and structure protection. Thermo-Gel[®] is designed to be used only with Thermo-Gel[®] equipment.



Thermo-Gel[®] 1 Gallon Container

- Part#: TG200L1
- Sold in a 4 pack case
- Class A Fire Retardant Gel
- U.S. Forest Service Approved
- Each gallon covers approximately 1,000 square feet at 2% and 2,000 square feet at 1%.



Thermo-Gel[®] 1 Gallon Pro Nozzle/Eductor

- Part#: TG20PK1 (20 GPM)
- Rugged metal design
- 1" NST
- Variable eductor at 1% or 2%
- Straight stream or fog pattern tip
- Pistol grip for easy handling
- Connects quickly to the 1 gallon container



Thermo-Gel[®] 1 Gallon Eductor

(For use with the 1 gallon Pro Nozzle)

- Part#: TG20E1 (20 GPM)
- Rugged metal design
- Designed to be used with the Pro Nozzle
- Variable eductor at 1% or 2%
- Flush mode for easy cleaning
- Connects quickly to the 1 gallon container



Fittings, Adaptors and Tips



Thermo-Gel® PRO/pak Tip:

- Designed to work with the TFT® PRO/pak
- Durable, metal design
- Adapts to allow application of Thermo-Gel®
- Provides a uniform coating of Thermo-Gel® to protect structures and suppress fires
- Part#: TGPPT



Thermo-Gel® Adaptors

- Durable, metal design
- Adapts standard 1" NST Pro Nozzle/Eductor to multiple styles
- Part#: TG01A (Adapts to 1 1/2" NST hose connection)
- Part#: TG02A (Adapts to 1 1/2" NPT hose connection)
- Part#: TG03A (Adapts to 1" NPT hose connection)



Thermo-Gel® Cap Assembly

- Lightweight, plastic design
- Designed to work with the 5 gallon backpack system
- Part#: TGCAP



Thermo-Gel® Pick-Up Tube

- Durable, rubber tube
- Designed to work with the 5 gallon eductor
- Part#: TGTUBE



TFT® PRO/pak

Thermo-Gel® and TFT® offer a new twist on a reliable and popular piece of equipment called the PRO/pak. With the design of the new Thermo-Gel® PRO/pak Tip, the PRO/pak now allows for the use of Thermo-Gel®, a superior extinguishing agent and structure protection product. Of course the PRO/pak will still accommodate foam products as well allowing you to choose the right tool for the job.



TFT® PRO/pak:

- Designed to work with Thermo-Gel® and foam products
- Durable design
- Shoulder sling allows for comfort during use
- Provides a uniform coating of Thermo-Gel® to protect structures and suppress fires
- Operates between 40-500 psi and produces 7-27 gpm.
- Holds 2.5 gallons of gel or foam concentrate
- Part#: TFTPP



Price includes a Thermo-Gel® PRO/pak Tip!



Class A Foam

Thermo-Foam™ is approved for all types of class a applications by both the US Forest Service and Underwriters Laboratories (U.L.). When mixed with water it reduces the surface tension of water allowing more water to absorb heat and provide excellent penetration into Class A fuels.



Thermo-Foam™

- Part#: TFOAM5, TFOAM275
- Available in 5 gallon containers, 55 gallon drums & 275 gallon totes
- Approved for use in all types of fixed and rotor wing aircraft
- Reduces water consumption by 3-5 times
- Can be mixed with fresh or salt water
- Suitable for use with high expansion foam generators
- Works with all types of proportioners, FireDos® and CAFS units

Distributed By:

THERMO TECHNOLOGIES, LLC.

400 East Broadway Suite 50 • Bismarck ND 58501
Phone: (701) 258-8208 • Toll Free (800) 538-8122
Fax: (701) 258-7259 • www.thermo-gel.com

Thermo Technologies, L.L.C.

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standards must be consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

Identity (As used on Label and List)

Thermo-Gel® 200L (red pail/red label)

Note: Blank Spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Distributor's Name and Address

Thermo Technologies, L.L.C.

400 East Broadway Suite 50

Bismarck, ND 58501

Emergency Telephone Number:

(800) 424-9300

Telephone Number for Information:

(701) 258-8208

Date prepared:

05/09/07

NA = Not Applicable

NE = Not Established

Signature of Preparer (optional)

NH = Non-Hazardous

Section II – Hazardous Ingredients/Identity Information

Serial Number 0485-1

Hazardous Components (Specific

Chemical Identity; Common Name (s))

OSHA PEL

NE

ACGHI TLV

NE

Other Limits

Recommended

Irritant (eye)

% (Optional)

Polyacrylate Polymer

Proprietary Blend

Petroleum hydrocarbon

5 mg/m3*

5 mg/m3*

*(Oil mist in air)

Proprietary Blend

Surfactant

NE

NE

Irritant (eye, skin)

Proprietary Blend

The final components of this product are listed in the US TSCA Chemical Substance Inventory. This product is not transport regulated.

SARA Section 313 Reportable Toxic Chemicals – NONE%

Section III – Physical/Chemical Characteristic

Boiling Point

Initial

96°C

Vapor Pressure (mm Hg.)

Not established

NE

Vapor Density (Air=1)

Not established

NE

Specific gravity (H2O=1)

Approx.

1.05

Melting Point

Not established

NE

Evaporation Rate

Not established

NE

(Butyl Acetate =1)

Solubility in Water

Emulsifies in water with some soluble components present.

Appearance and Odor

White opaque liquid with mild odor of hydrocarbon.

Section IV – Fire and Explosion Hazard Data

Flash Point (Method Used) Greater than 100°C (components summary)

Flammable Limit LEL NE **UEL** NE

Extinguishing Media

Water fog, CO2, dry chemical extinguishments.

Special Fire Fighting Procedures

Use water fog. Avoid water jet/stream. Use self-contained breathing apparatus and protective gear for any hostile fire. Spilled product creates slippery conditions.

Unusual Fire and Explosion Hazards

Petroleum hydrocarbon component, although formulated to prevent separation, if separated can burn. Its flash point is in the range of 265°F (method: Cleveland Open Cup).

Section V – Reactivity Data

Stability	Unstable	Conditions to Avoid	None known.
	X Stable		

Incompatibility (Material to Avoid)	Strong oxidizers, strong acids.
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Hazardous Decomposition or Byproducts	On thermal decomposition, oxides of carbon and nitrogen.
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Hazardous	May Occur	Conditions to Avoid	None known.
Polymerization	X Will not Occur		

Section VI – Health Hazard Data

Routes of Entry	Inhalation: Yes Skin: Yes Ingestion: No
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Health Hazards (Acute and Chronic)	Components may cause skin and eye irritation. Irritation of the mucous membranes may result from inhalation of vapors/mist forms. Proper handling procedures, including skin and eye protection are advised.
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Carcinogenicity	NTP: No IARC: No OSHA: No
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Signs and Symptoms of Exposure	Reddening, swelling of the affected area with burning, itching or other discomfort.
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Medical Conditions Generally Aggravated by Exposure	Not confirmed. Existing cuts, rashes, allergies and other sensitive areas. Respiratory disorder may be aggravated.
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Emergency and First Aid Procedures	Eyes: flush thoroughly with water. Skin: wash with soap and water. Inhalation: move to fresh air. Ingestion: If ill effects occur, get medical attention. For any continued discomfort/discoloration get professional medical attention.
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Section VII – Precautions for Safe Handling and Use

Steps in Case of Released/Spill	Contain. Wear protective gear. Collect, using suitable absorbent if needed. Flush residuals to the drain for normal biological wastewater treatment. Put collected material into suitable containers for proper disposal. Exercise caution in spill area as spilled material creates very slippery conditions.
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Waste Disposal Method	Incinerate according to applicable regulations. Diluted liquid form may be flushed with water to normal wastewater treatment in accordance with Local, State/Provincial and Federal regulations.
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Precautions to be Taken in Handling/Storage	Components may cause skin and eye irritation. Proper handling procedures, including skin and eye protection are advised. Avoid inhalation of vapors/mist forms. Do not ingest.
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Other Precautions	Exercise caution with spilled product as very slippery conditions, especially in contact with water, are created. Prevent release of concentrate to waterways.
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Section VIII – Control Measures

Respiratory Protection	Not required for normal product end use. Observe any Section II MSDS exposure limits.
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Ventilation Local Exhaust	Ensure vapors/mist forms are removed.	Special	Not required.
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Mechanical	Recommended	Other Ventilation	Not required.
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Protective Gloves	Impervious neoprene or rubber.	Eye Protection	Safety goggles.
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Other Protective Clothing or Equipment	Apron, shoes, or other to prevent skin contact.	Work/Hygienic Practices	Wash thoroughly after handling.
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